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Analysis of Quality of life and anxiety in an underprivileged city in IRAN during the COVID-19 pandemic: a cross-sectional study

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Article info

Abstract

Introduction: The COVID-19 pandemic started in December 2019 in China. Its first confirmed cases were in Feb 2020 in Iran. It affects not only physical health but also well-being and Quality of life. Previous Studies have widely explored the Quality of life in wealthy communities during the COVID-19 pandemic; the present study selected the earthquake-prone and underprivileged city of Zarand (Iran) and aimed to evaluate the Quality of life and anxiety.

Methods: 291 patients infected with COVID-19 were included using conventional non-random sampling. The participants' Quality of life and anxiety were evaluated using the online WHO-Quality of Life-BREF and Beck Anxiety Inventory (BAI). Data were analyzed by SPSS software version 26 using Spearman's correlation, Multiple linear regression, T-test, and Kruskal-Wallis.

Results: The survey revealed an average Quality of Life score below 50 out of 100, indicating a low quality of life. 58% of patients reported moderate to severe anxiety, and there was a negative correlation between all of the four physical (p< .001), psychological (p< .001), social (p= .007), and environmental (p< .001) domains of Quality of life and anxiety, respectively. The physical domain was more strongly negatively correlated to anxiety. Degree of education only significantly and positively correlated to the social domain of quality of life. Participants ranged from 18 to 58 years, and the positive correlation between age and the physical and psychological domain was significant. No significant correlation was found between the Quality of life, sex, and marital status.

Conclusions: The current study provides evidence of low Quality of life and high anxiety levels in patients who experienced COVID-19. This consequence implicates immediate considerations and an increase in psychological services to be considered by policymakers and officials.

Keywords: Quality of life, COVID-19, Underprivileged, Beck Anxiety Inventory (BAI), WHOQOL-BREF

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Introduction

Quality of life is a subjective and multidimensional concept that emphasizes the individual's perception of his current situation. Although it is impossible to provide a specific definition of Quality of life, many studies believe it includes people's social, psychological, and health status (Bonomi et al., 2000). WHO defines Quality of Life as an individual's perception of their position in life in the context of the culture and value systems in which they live and concerning their goals, expectations, standards, and concerns (Melo-Oliveira et al., 2021). The COVID-19 pandemic, which first started in December 2019, has since then been a health emergency with dramatic consequences worldwide (Wang et al.,2021; Alqahtani et al., 2021; Chan et al.,2019; Zhang & Ma, 2020); Its first confirmed cases were in Feb 2020 in Iran (Azarafza et al.,2020). The COVID-19 virus, due to its highly infectious pathogens, affects not only physical health but also well-being and other aspects of life (Kontoangelos et al.,2020); it led to psychological distress (anxiety, depression) (Bao et al.,2020; Chowdhury, 2017), social distancing, lockdown of non-essential services and schools, quarantine, and economic challenges (due to lockdown) (Codagnone et al.,2020). Various studies in different settings have shown that the COVID-19 pandemic has impacted the Quality of life (Dorri et al., 2021; Choi et al., 2021; World Health Organization, 2022; Lakhan et al., 2020; Samlani et al., 2020).

Quality of life is related to mental health, so anxiety and depression directly harm the Quality of life (Hansson, 2002). Anxiety appears as a future-oriented mood state, which includes a complex cognitive, emotional, physiological, and behavioral reaction system formed by preparation for anticipated events or situations perceived as threats. Pathological anxiety occurs when there is an overestimation of the perceived threat or a misappraisal of the danger of a situation, leading to excessive and inappropriate responses (Chand et al.,2022). Recent studies have shown that the COVID-19 outbreak has caused mental health problems in people (Şimşir et al.,2022). One recent study has shown that during the strict quarantine measures by the Chinese government, people experienced mental health distresses such as depression and anxiety. More than half of the people reported moderate to high anxiety levels (Qiu et al.,2020), and quality of life is a potential predictor of increased anxiety (Siew et al.,2021).

In the growing trend of multidimensional problems related to the COVID-19 pandemic, causing six outbreaks – and probably causing more outbreaks – the Quality of life is now closely related to COVID-19 (Valero-Moreno et al.,2020). Zarand City is considered one of the relatively underprivileged areas in terms of infrastructure, recreation, economy, and health facilities, which receives government allocations to improve inequality. Located in the Alpine-Himalayan orogenic belt, Zarand has suffered many earthquakes, with the most devastating happening in 2005 (Talebian et al., 2005). Also, In Iran, the political and economic circumstances and global sanctions have significantly exacerbated the challenges associated with managing the COVID-19 pandemic, leading to increased hardships and a deepening of systemic inequality (Takian et al., 2020; Rezaei et al., 2023).

This study focuses on the quality of life and anxiety within an underprivileged community frequently affected by natural disasters. In Iran, most studies prioritize well-developed cities with established medical education programs, often self-funded without government support. However, this neglects a significant portion of the population in smaller and underprivileged areas, contributing to systemic inequality.

Research purpose

Previous research primarily focused on affluent urban communities with established universities, neglecting the investigation of quality of life (QoL) in underprivileged communities of developing countries during the COVID-19 pandemic. Zarand City, an underprivileged community, which experienced past natural disasters like earthquakes and droughts, now faces the added burden of the COVID-19 outbreak amidst financial and political hardships. Such studies may bring attention to the importance of small and underprivileged communities' quality of life (QoL). No Therefore, this pioneering study aims to assess the QoL and anxiety levels of individuals affected by COVID-19 in Zarand City. Additionally, the study analyzes the factors influencing QoL, such as anxiety, age, education, and marital status.

In summary, this study aims to bridge the research gap by examining QoL in an underprivileged community during the COVID-19 pandemic.

The research hypotheses of the study were as follows:
1) The COVID-19-related difficulties and challenges impact sufferers' quality of life (Xiong et al., 2020).
2) The high level of anxiety of sufferers of Covid-19 negatively impacts their quality of life (Cori et al., 2021).
3) A higher level of education for sufferers of Covid-19 leads to a better level of quality of life (Vu et al., 2020).
4) Female Sex and higher age are associated with a lower quality of life of people with COVID-19 (Brown & Roose, 2011; Purba et al., 2021).
5) The quality of life of single people with COVID-19 is higher than married people with COVID-19 (Mohsen et al., 2022).

Methodology

Participants

The participants were 291 patients with positive laboratory tests for COVID-19 in Zarand City. As shown in Table 1, 227 (78%) were female, and 64 (22%) were males. The mean age of the participants was 36.48 years and ranged from 18-58. Most of the samples had Bachelor's degree (47.8%), while 1.7%, 24.1%, 14.4%, 10.7%, and 1.4% had no high school diploma, Highschool diploma, Associate degree, Master's degree, or doctorate or higher degree, respectively. Regarding Marital Status, 42 (14.4%) were single, 246 (84.5%) Married, and 3 (1%) were Divorced (Table 1).

Tab. 1. Frequency, percentage, the mean and standard deviation of demographics and questionnaire results.

		N	N%	Mean	SD
Sex	Male	64	22.0%		
	Female	227	78.0%		
	Other	0	0.0%		
Degree of education	No highschool diploma	5	1.7%		
	Highschool diploma	70	24.1%		
	Associate degree	42	14.4%		
	Bachelor's degree	139	47.8%		
	Master's degree	31	10.7%		
	Doctorate or higher	4	1.4%		
Marital Status	Single	42	14.4%		
	Married	246	84.5%		
	Divorced/Widowed	3	1.0%		
Beck Anxiety Inventory	Minimal	51	17.5%		
	Mild	69	23.7%		
	Moderate	77	26.5%		
	Severe	94	32.3%		
Age (years)				36.48	9.96
The physical domain of QoL Score				40.66	19.56
The psychological domain of QoL Score				38.47	18.04
The social domain of QoL Score				38.03	21.97
The environmental domain of QoL Score				48.39	17.55

Note. N: Number of cases; N%: Number of cases by percentage; SD: Standard deviation; QoL: Quality of life.

Procedure

This study was conducted in Zarand City amid the sixth wave of COVID-19 between February 23, 2022, and March 15, 2022. During data collection, Zarand was in a lockdown and color-coded as a red (very high-risk) by the government. The inclusion criteria for this study were 18 years or older, the ability to self-report by completing an online questionnaire, being a resident of Zarand City, and having contracted COVID-19 infection approved with laboratory testing in the last 14 days. The exclusion criteria included age under 18, missing data, COVID-19 infection not approved by laboratory tests, or a positive COVID-19 test reported more than 14 days before participation. Participants were selected using Convenience non-random sampling and completed an anonymous online survey. Participants were not asked for personal information and voluntarily participated in this study to avoid bias. The survey link was created in "Google Forms" and shared with patients via social media platforms for a limited time. The time of the survey's completion was approximately 10 minutes. The first page of the survey had written information about the study's objectives and requested the participants' informed consent. The survey included all the measures described in the next section. The Shahid Beheshti University of Medical Sciences Ethical Committee approved the study. The research followed all the ethical guidelines and procedures.

Ethical considerations

The ethical committee approves this study of the Shahid Beheshti University of Medical Sciences (IR.SBMU.RETECH.REC.1400.939). Participants were informed of the research purpose before opening the link, and their willingness to participate was obtained at the start of the questionnaire. They were assured of information confidentiality and anonymous result publication.

Measurements

Demographic information: Participants completed a questionnaire regarding their sex, age, degree of education, and Marital status.

WHOQOL-BREF (World Health Organization Group, 1996): The WHOQOL-BREF is a 26-item instrument consisting of four domains: physical health (7 items), psychological health (6 items), social relationships (3 items), and environmental health (8 items); and two overall QOL and general health items. The physical health domain includes items on mobility, daily activities, functional capacity, energy, pain, and sleep. The psychological domain measures self-image, negative and positive attitudes, self-esteem, learning ability, memory and concentration, spirituality, and mental status. The social domain contains questions on personal relationships, social support, and sex life. The environmental health domain covers financial resources, safety, health, social services, environment, opportunities to acquire new skills and knowledge, recreation, general environment, and transportation. WHOQOL-BREF is based on the Likert scale from 1 to 5, and all scores are transformed to reflect 4 to 20 for each domain, with higher scores corresponding to a better QOL. The structural factors of this instrument have acceptable validity and reliability in Iran. Intra-cluster correlation and Cronbach's alpha values were more than 0.7 in all areas, and internal consistency between four areas in the group of healthy people was equal to 0.73 (Nejat et al.,2006).

Beck Anxiety Inventory (BAI, Beck et al.,1993): This is a 21-item self-report inventory that measures the severity of anxiety in psychiatric and non-psychiatric populations. Participants rate the items according to how much they have suffered by the particular symptom over the past week; each item is rated on a 4-point scale ranging from 0 (not at all) to 3 (severely-I could barely stand it). The score range is between 0-63. The score ranges for different levels of anxiety were normal (0 to

7), mild (8 to 15), moderate (16 to 25), and severe (26 to 63). Kaviani & Mousavi showed that the Persian version of BAI proved good reliability (r = 0.72, p < 0.001), perfect validity (r = 0.83, p < 0.001), and excellent internal consistency (Alpha = 0.92). The score ranges for different levels of anxiety were normal (0 to 7), mild (8 to 15), moderate (16 to 25), and severe (26 to 63) (Kaviani & Mousavi, 2008).

Statistical Analysis

IBM SPSS ver. 26 was used for statistical analysis.

Primarily, Spearman's correlation was performed to measure the correlation between the WHO-Qol-BREF and BAI, Age, and degree of education. Spearman's correlation shows the significance of correlation (p-value) and correlation coefficient (ρ; the degree two variables are dependent).

The independent T-test for the mean difference was implemented for the sex group. The independent T-test shows the significance of the mean difference (p-value) between the two sex groups (male and female) but does not measure the effect size; Therefore, Cohen's d is measured in case of a significant mean difference. The independent T-test assumes normality of distribution, which is a large sample size (n > 30) and is considered normally distributed even if the quantitative Kolmogorov-Smirnov normality test is violated.

Kruskal-Wallis (Also known as one-way ANOVA on ranks) was used to measure the mean difference in WHO-QoL-BREF score between the three marital status groups. In case of small sample size (n < 30) and violation of the Kolmogorov-Smirnov normality test, the ANOVA test is inappropriate, and the Kruskal-Wallis test should be used.

We used multiple linear regression to comprehensively analyze the relationship between variables and Quality of Life (QoL). This method predicts changes in QoL based on the variables included. We considered variables that showed significant correlations with different aspects of QoL and did not violate assumptions like autocorrelation and multicollinearity. Categorical variables, such as educational level or BAI, were transformed into dummy variables, with the first category

serving as the reference, and changes were compared to it. For Standardized b, effect sizes between 0.10–0.29 are said to be only small, effect sizes between 0.30–0.49 are medium, and effect sizes of 0.50 or greater are large (Cohen, J. 1988).

Results

QoL and BAI scores

58.8% of our sample reported moderate and severe anxiety levels. Only 17.5% reported a minimal anxiety level. In the QoL questionnaire, average scores in all domains were lower than 50 out of 100; the lowest mean was for the social domain of QoL (Table 1).

QoL descriptive by demographics and BAI

Men reported lower mean scores in physical and psychological domains and higher scores in social and environmental domains. We observed an upward trend between QoL and degree of education; although participants in the "no high school diploma" opposite this trend, the group size is only 5 (Table 1). In marital status, the divorced/widowed group scored lower in all domains except for the environmental domain. There was a consistent downward trend between all the QoL domains and BAI, with the minimal anxiety group showing the best QoL score on average. Table 2 and Figure 1 summarize the results of WHOQOL-BREF grouped by BAI, Degree of education, Marital status, and sex. Figure 2 shows a scatter plot of WHOQOL-BREF and Age with an upward trend between the two.

Mean difference tests, effect size, and correlations

T-tests for gender showed no significant mean difference in physical ($t(289)$ = 1.904, p = 0.058), psychological ($t(289)$ = 1.674, p = 0.095), social ($t(289)$ = -0.433, p = 0.666), and environmental ($t(90.57)$ = -1.787, p=0.077). Kruskal-Wallis

Tab. 2. WHOQOL-BREF QoL domains results grouped by demographics and BAI results.

	M	Physical		Psychological		Social		Environmental	
		SD	M	SD	M	SD	M	SD	
Sex	Male	44.75	19.15	41.80	19.29	36.98	24.93	44.63	19.65
	Female	39.51	19.56	37.54	17.60	38.33	21.11	49.45	16.80
Degree of education	No highschool diploma	52.86	26.77	56.67	23.68	51.67	35.06	58.13	21.72
	Highschool diploma	39.03	19.36	33.75	17.91	32.50	23.58	45.89	17.37
	Associate degree	37.24	16.98	36.11	16.19	35.32	18.66	46.13	17.11
	Bachelor's degree	40.29	20.27	39.72	18.53	39.15	21.41	49.89	17.55
	Master's degree	46.43	18.28	42.47	14.69	45.16	19.81	48.29	18.47
	Doctorate or higher	58.04	4.49	48.96	16.09	52.08	21.92	52.34	10.33
Marital Status	Single	42.09	15.79	36.61	16.53	39.48	22.55	47.25	18.11
	Married	40.48	20.26	38.89	18.37	37.87	21.96	48.59	17.52
	Divorced/Widowed	35.71	6.19	30.56	8.67	30.56	19.25	47.92	17.21
BAI	Minimal	57.42	19.59	48.28	21.49	46.57	28.19	53.62	19.46
	Mild	42.39	17.52	40.76	16.06	36.71	20.97	49.37	16.04
	Moderate	41.23	15.02	40.21	13.50	39.39	18.96	49.31	16.04
	Severe	29.83	17.41	30.05	17.27	33.24	19.91	44.08	17.97

Note. QoL = Quality of life; M = Mean; SD = Standard deviation; BAY = Beck Anxiety Inventory

Fig. 1. Multiple lines of mean score of Quality of life domains vs. Beck Anxiety Inventory/degree of education (Note: Clustered bar of mean score of Quality of life domains vs. Marital status / Sex; QoL: Quality of life)

Multiple Line of Mean Score of QoL - BAI/Educational Level
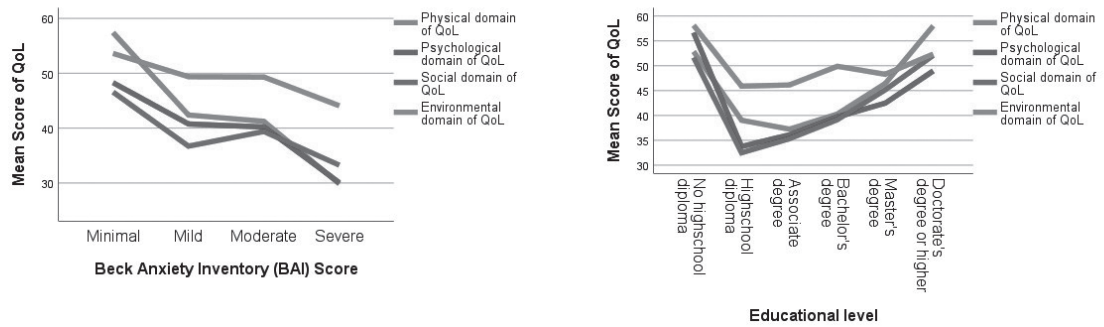
Clustered Bar of Mean Score of QoL - Martial Status/Sex
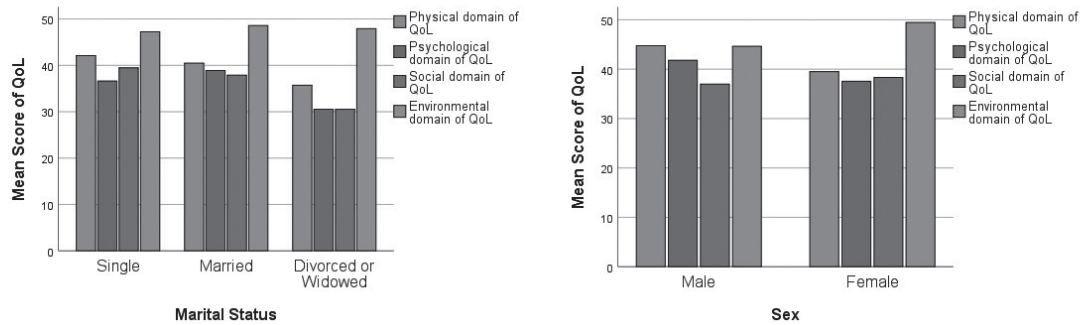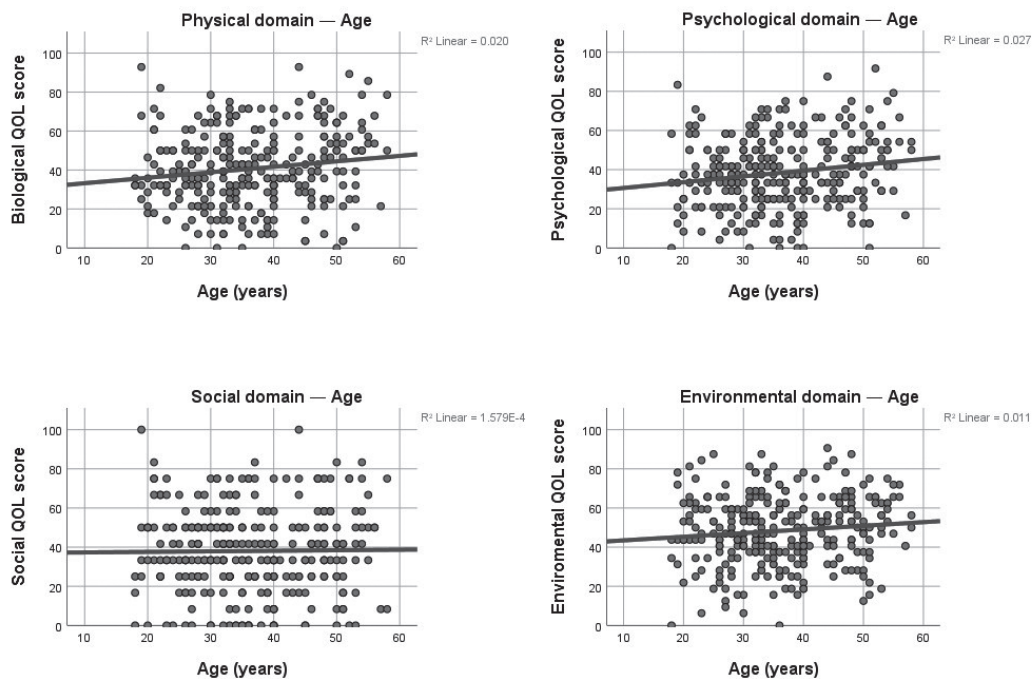

Fig. 2. Scatter-plot of the score of Quality of life domains vs. age (years). QoL: Quality of life.

Scatter-plot of QoL domains score - Age

for QoL domains and marital status (results were H(2, n=291) = 0.307 p = .858 for physical domain; H(2, n=291) = 1.483 p = .476 for psychological domain, H(2, n=291) = 0.452 p = .798 for social domain, H(2, n=29+) = 0.045 p = .978 for environmental domain) showed no significant mean difference between single, married, and divorced participants in Quality of life in all domains.

The Spearman's test showed a significant and moderate correlation between physical and psychological domains and Beck anxiety inventory score but a weak between physical and psychological domain and age; a Significant but weak correlation between social and environmental domains and

anxiety; a Significant but weak correlation between physical, psychological and social domain and degree of education. Spearman's results are summarized in Table 3.

Multiple linear regression

We utilized multiple linear regression analyses to assess the impacts of independent variables on Quality of Life (QoL). Our regression model included age, education level, and Beck Anxiety Inventory (BAI), as only these variables demonstrated a significant relationship with QoL domains. To address

Tab. 3. Correlations and T-tests for QoL results grouped by demographics and BAI results.

			Physical	Psychological	Social	Environmental
Spearman's rho	Age (years)	ρ (rho)	.144*	.148*	-.003	.095
		p value	.014	.012	.957	.108
	Degree of education	ρ (rho)	.124*	.141*	.177*	.077
		p value	.035	.016	.002	.193
	BAI	ρ (rho)	-.439*	-.322*	-.157*	-.194*
		p value	<.001	<.001	.007	.001
Kruskal-Wallis	Marital Status	p value	.858	.476	.798	.978
T-Test	Sex	p value	.058	.095	.666	.077

Note. *: Correlation is significant; QoL: Quality of life.

Tab. 4. Multiple linear regression results grouped by demographics and BAI results.

Dependent variable	Predictors	b	Std b	t	P value	Adj R²
The physical domain of QoL						.242
	Age (years)	.235	.120	2.303	.022	
	BAI Mild	-14.569	-.317	-4.587	<.001	
	BAI Moderate	-16.428	-.371	-5.310	<.001	
	BAI Severe	-27.009	-.647	-9.092	<.001	
	Degree of education: Associate & Bachelor's	-1.460	-.036	-.608	.544	
	Degree of education: Master & Doctorate	5.349	.089	1.489	.138	
The psychological domain of QoL						.142
	Age (years)	.248	.137	2.480	.014	
	BAI Mild	-6.404	-.151	-2.055	.041	
	BAI Moderate	-8.212	-.201	-2.706	.007	
	BAI Severe	-17.573	-.456	-6.031	<.001	
	Degree of education: Associate & Bachelor's	2.788	.075	1.184	.238	
	Degree of education: Master & Doctorate	5.784	.104	1.641	.102	
The social domain of QoL						.450
	Age (years)	-.039	-.018	-0.306	.760	
	BAI Mild	-8.984	-.174	-2.244	.026	
	BAI Moderate	-8.118	-.163	-2.082	.038	
	BAI Severe	-12.866	-.274	-3.436	.001	
	Degree of education: Associate & Bachelor's	4.187	.093	1.384	.168	
	Degree of education: Master & Doctorate	11.342	.168	2.505	.013	
The environmental domain of QoL						.280
	Age (years)	.164	.093	1.584	.114	
	BAI Mild	-3.627	-.088	-1.124	.262	
	BAI Moderate	-4.112	-.104	-1.309	.192	
	BAI Severe	-9.235	-.247	-3.061	.002	
	Degree of education: Associate & Bachelor's	1.698	.047	0.696	.487	
	Degree of education: Master & Doctorate	.659	.012	.181	.857	

multicollinearity resulting from certain dummy variables in the education level category, we consolidated them into three educational variables: (1) No high school diploma and high school diploma (serving as the reference variable), (2) Associate and Bachelor, and (3) Master and Doctorate. Therefore, the BAI reference category was minimal anxiety (Table 4).

All regression models predicted QoL in multiple domains significantly; Physical domain $F_{(6, 284)} = 16.395$, $p < .001$, adj $R^2 = .242$; Psychological domain $F_{(6, 284)} = 8.999$, $p < .001$, adj $R^2 = .142$; Social domain $F_{(6, 284)} = 3.267$, $p = .004$, adj $R^2 = .045$; Environmental domain $F_{(6, 284)} = 2.385$, $p = .029$, adj $R^2 = .028$. Independent variables have varying predictive effects on QoL domains, with the social domain showing the strongest association and the psychological domain the weakest (adj. $R^2 = .450$, $.142$; respectively).

Anxiety has a more prominent influence on each QoL domain than age and education (standardized β).

As previously shown, age is positively correlated to physical ($t = 2.303$, $p = .022$, $\beta = 0.235$), psychological ($t = 2.480$, $p = .014$, $\beta = 0.248$), and environmental ($t = 1.584$, $p = .144$, $\beta = 0.164$), although the correlation is not significant in the latter. In the social domain of QoL, the predictive value is negative but not significant ($t = -0.306$, $p = .760$, $\beta = -0.039$).

Anxiety significantly impairs all domains of QoL, with its detrimental effect increasing as anxiety levels escalate, peaking in the severe anxiety group (with a minor exception in the social domain). In the environmental domain of QoL, only the severe anxiety group exhibits a significantly lower QoL when compared to the minimal anxiety group ($t = -3.061$, $p = .002$, $\beta = -9.235$). Severe anxiety impacts physical and psychological QoL the most (standardized $\beta = .647$ and $.456$, respectively).

Education does not significantly correlate with overall QoL, except in the social domain, where having a master's or doctorate significantly improves QoL compared to those with lower education levels ($t = 2.505$, $p = .013$, $\beta = 11.342$). In the social QoL domain, the impact of educational level is similar to moderate anxiety but lower than severe anxiety.

Discussion

We discuss the results in six sections: COVID-19, Anxiety, Age, Education Degree, Sex, and Marital status. The present study does not aim to measure the impact of COVID-19 infection and pandemics on the QoL. However, it aims to measure the QoL of the residents infected with the COVID-19 virus living in the city of Zarand, which has a long history of deprivation and natural disasters such as earthquakes and droughts.

COVID-19

Our study reveals a low quality of life (QoL) among the infected population of Zarand City, with all domains scoring below 50 (Table 1). Although the WHOQOL brief does not provide a specific reference value or cut-off for defining QoL, Hawthorne et al. (2006) suggested a mean score of 70 as a reference point. Moreover, Silva et al. (2014) concluded in

their study on older adults that scores below 60 should indicate a low QoL.

Iran has been severely affected by the COVID-19 pandemic, with significant losses and a high number of confirmed infections (Salimi et al., 2020) (Johns Hopkins University, 2023), and our study participants tested positive for COVID-19 within two weeks before completing the questionnaire. COVID-19 primarily presents upper respiratory symptoms such as cough, sneezing, fever, runny nose, and sore throat. However, it can also cause shortness of breath, diarrhea, nausea, vomiting, fatigue, pain, and decreased daily activity capacity (Li et al., 2020). These symptoms justify the reported low quality of life (QoL) experienced by the study participants.

As long as the psychological QoL is concerned, numerous studies conducted during the COVID-19 pandemic consistently demonstrate a high prevalence of psychiatric symptoms among the general population. Factors such as pandemic-induced stress and uncertainty, social isolation, financial hardships, and concerns about personal and family health likely contribute to developing anxiety, depression, and sleep disturbances. Collectively, these studies provide compelling evidence of the pandemic's significant adverse impact on the overall quality of life, mental health, and well-being (Xiong et al., 2020). Additionally, emerging research suggests COVID-19 per se may have an independent role in triggering depression, anxiety, and sleep problems (Mazza et al., 2020; Salari et al., 2020). Based on a meta-analysis of patients with COVID-19, anxiety and depression were common, with rates of 16.6% and 37.7%, respectively (Dong et al., 2021). According to a meta-analysis, the prevalence of sleep problems among patients infected with COVID-19 was 52.39%. (Jahrami et al., 2022).

Iranians in Zarand have a strong affinity with the population of South Asia, despite their Middle Eastern location. Social ties are highly valued in Iranian culture, leading to close connections and strong community relationships (Javidan & Dastmalchian, 2003). Iranian Ministry of Health and Medical Education imposed social distancing protocols (Rahmanzade et al., 2020), and as multiple studies have indicated, social distancing significantly impacts the quality of life (QoL) within the social domain (Geirdal et al.,2021; Peterson et al., 2021; Spencer-Laitt et al., 2022).

Also, the WHOQOL-BREF covers questions on the environmental domain of QoL. Some of these questions that probe the sense of freedom, sense of security, physical safety, and access to recreation and leisure are more likely to be affected by COVID-19. Lockdowns, losing jobs, bankruptcy, and inflation aggravated financial difficulties during COVID-19, and access to transportation was also restricted by the government (question 25 of WHOQOL-BREF) (Wang et al.,2021; Rahmanzade et al., 2020).

Anxiety

The fear of infection and death has led to reporting of concern and anxiety complaints. Being worried about themselves and their loved ones, COVID-19 might downgrade the QoL scores (Cori et al., 2021). We found that 58.8% of participants in

Zarand City reported moderate or severe anxiety levels. This is much more than the reported prevalence of 16.6% observed in a meta-analysis study involving 5,144 multinational patients (Dong et al., 2021). Of course, the study of Dong et al. (2021) involved a multinational population, and it predominantly consisted of individuals of Chinese ethnicity, which mitigated the influence of the country of residence on anxiety. Regarding the studies conducted on Iran, two extensive sample size studies reported the prevalence of moderate to severe anxiety in the general population to be 40.4% (n= 10,754) and 80.17% (n= 23,455), respectively, in the first week of COVID-19 emergence in Iran in March 2020 (Moghanibashi-Mansourieh, 2020; Sharif Nia et al., 2021). These results and our findings prove a high anxiety rate in Iran.

As a result of our research, anxiety was significantly and negatively correlated to all domains of QoL and also has a more prominent impact on each domain of QoL compared to age and education (Table 4). The physical domain had the highest correlation effect size, followed by the psychological and social domains. However, the environmental domain showed the smallest effect that was only significant in the severe anxiety group. Our findings align with the study conducted by Lee et al. (2013), which demonstrated a significant association between anxiety and all aspects of Quality of Life. While Brown & Roose (2011) did not observe a significant relationship between anxiety and Quality of Life (QoL) in the environmental domain, our study revealed a significant correlation. However, it was only significant within the severe anxiety group and exhibited a small effect size, lower than other domains (refer to Table 4). Also, A meta-analysis examining the correlation between Quality of Life (QoL) domains and anxiety revealed that the psychological and social domains were the most adversely affected (Olatunji et al., 2007).

Unsurprisingly, our findings indicate that anxiety negatively impacted the physical QoL more than other domains. The presence of heightened anxiety among those with severe COVID-19 symptoms may adversely affect their overall well-being, contributing to a decline in their physical QoL (Afzali et al., 2022; Dong et al., 2021; Ferreira et al., 2021).

The social domain of QoL included questions regarding interpersonal relationships and social support. Ferreira et al. (2021) reported that individuals in home quarantine reported increased anxiety and lower health-related quality of life (HRQoL). Similarly, Hoffart et al. (2022) conducted a longitudinal study on anxiety during pandemics. They found a strong correlation between anxiety levels and the strictness of social distancing protocols implemented but only a negligible correlation with the infection rate in Norway. On the other hand, anxiety independently can contribute to feelings of social disconnection and social isolation, and this can result in a lack of social support, which is essential for maintaining a high quality of life (Dos Santos et al., 2021; Galea et al., 2020).

Age

In the current study, the multiple regression analysis showed a positive and significant correlation between age and physical and psychological QoL. The correlation between age and

quality of life (QoL) is multifaceted and influenced by many factors. A study by Brown et al. (2011) found that aging does not decrease the overall quality of life except for the physical domain (Brown & Roose, 2011). Similarly, Thadathil et al. (2015) observed a decline in physical quality of life with age among 220 adults aged 60 and above. Additionally, Chen et al. (2020) discovered a negative association between age and physical function. The discrepancy in QoL results between the mentioned studies and our own can be attributed to the age range of our participants (18 to 58 years), which does not include older patients.

Degree of education

Although there is a disparity between the results of the multiple regression (three groups) and Spearman's analysis (six groups) (refer to multiple regression in results), both methods indicate a positive correlation. However, the Spearman analysis demonstrates significance across all domains, whereas the multiple regression analysis only shows significance in the social domain (refer to Tables 3 and 4). These findings align with Gil-Lacruz et al. (2020), Purba et al. (2021), and Kharshiing et al. (2021). Previous research suggests that individuals with lower education levels face skill deficiencies, increased vulnerability to job loss, financial difficulties, social challenges, and higher rates of anxiety and stress-related disorders (Javed et al., 2016; Taylor et al., 2009). Moreover, evidence highlights education as a significant predictor of health status, employment, decision-making, problem-solving, and critical thinking abilities (Oreopoulos & Salvanes, 2011). Individuals with higher education tend to possess better coping strategies, resulting in lower anxiety, improved mental health, and a higher quality of life (Vu et al., 2020; Tang et al., 2017). This may be due to various factors, including increased access to social and economic resources, better job prospects, and higher levels of social support. Moreover, having a higher level of education may increase social mobility, which can create more opportunities for social interaction and community involvement and result in greater social connectedness and a sense of belonging, which are vital components of social quality of life.

Sex

Despite previous studies by Gil-Lacruz et al. (2020), Purba et al. (2021), and Yang et al. (2021) reporting lower quality of life for women compared to men, our findings indicate no significant difference in quality of life between the sexes. Cori et al. (2021) discovered that men are disproportionately affected by COVID-19 compared to women. This could be attributed to traditional gender roles in Zarand, where men are more socially and financially engaged while women's activities primarily focus on their families. These findings suggest that the COVID-19 pandemic may have impacted men's lives more, limiting their previously diverse roles. Men are at higher risk of mental and physical disorders, shorter lifespans, and increased risk of injury, accidents, and violence.

Conversely, women benefit from larger social networks and greater emotional support and experience positive effects on their well-being. Men often face heavier workloads and may be less likely to seek medical attention unless necessary (Baker et al., 2020). It is important to acknowledge a limitation in our study regarding sex distribution, as most participants were women (78% vs. 22%, Table 1), which could introduce bias to the analysis despite statistical corrections.

Marital status

This study observed no significant mean difference in quality of life across single, married, and divorced participants. The study findings are consistent with Mohsen et al. (2022). Conversely, Ferreira et al. (2021) found that married individuals have a higher quality of life and efficiency than single or divorced individuals. Fu & Noguchi (2016) discovered that stable long-term partnerships or marriages lead to better health, life satisfaction, and emotional well-being. They experience less anxiety and depression than single or divorced individuals (Purba & Fitriana, 2019; Koball et al., 2010). The disparity in findings might be attributed to married individuals with COVID-19 having heightened concerns about their own and their partner's health, leading to increased anxiety and a decline in their quality of life. Financial responsibilities and fear of job loss can further increase anxiety levels and negatively impact their well-being.

Implications

This study represents a pioneering and unique investigation into the quality of life of residents in the underprivileged city of Zarand. It is one of the very few studies that have focused on populations from underprivileged backgrounds. The study's distinctiveness lies in its valuable findings and data collection, which occurred during Iran's second deadliest wave of the COVID-19 pandemic. Such studies bring attention to the importance of the quality of life (QoL) of small and underprivileged communities, while also assisting policymakers in planning and providing solutions to enhance the QoL of people in crisis. The research findings have practical implications for the initiatives undertaken by the Iranian government to address the challenges faced by residents in underprivileged areas during the COVID-19 pandemic and other disasters.

Limitations and future studies

Considering that in cross-sectional studies, specific results may be observed depending on the particular period in which the research is conducted, these studies cannot show the continuity of effects of the COVID-19 epidemic on various aspects of people's Quality of life. In the future, longitudinal studies should also investigate the relationship between anxiety and Quality of life and compare the results with cross-sectional studies. Although online surveys were the best data collection method during the COVID-19 epidemic due to the

lockdown, the findings may be biased due to restricted access to questionnaires. Participants were between 18 and 58 years old, and older people did not participate in this research which may be due to limitations in affording smartphones and internet plans and general and digital illiteracy; so it is suggested that the study In the future, attention should be paid to the presence of older people in the research and investigation of the desired indicators. Regardless of Age, our study missed populations in the lower social class who can afford smartphones and internet plans; there are no exact estimates on the number of the neglected population, but their non-attendance may affect the result, though not significantly.

Despite some limitations of online studies, our research findings can provide a perspective on the psychological effects of the COVID-19 pandemic on the Quality of life and related factors.

The other limitation is that females dominate the sex of our participants (Females 58% vs. Males 22%). Although statistical tests are designed to minimize bias, findings can skew due to unequal participation by the sexes. As far as future research is concerned, it would be essential to study the quality of life of underprivileged populations during disasters.

Conclusions

The quality of life among individuals infected with COVID-19 was consistently low across all domains. Anxiety exerted a greater impact on the quality of life compared to other variables in this study. It is noteworthy that 58.8% of our participants reported experiencing moderate to severe levels of anxiety, indicating a significant prevalence of anxiety symptoms among the COVID-19-infected population of Zarand city; we suggest further studies with larger sample size and more diversity in Zarand. We also believe policymakers and local officials should provide affordable psycho-social support interventions.

Mohammadamin Abdi devised the methodological content, analyzed the data, and contributed to the interpretation of the research findings. Mohammadamin Abdi and Arefeh Arabpour Dahouei contributed to the writing and editing of this paper and collected the references, and wrote the final version of this paper

Conflict of interest
The authors report no conflicts of interest.

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